## UNITED STATES PATENT AND TRADEMARK OFFICE **CERTIFICATE OF CORRECTION**

PATENT NO.

DATED

: 6,848,623 B2

: February 1, 2005

INVENTOR(S): Weimer et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Drawing sheets, consisting of Fig. 1-7, should be deleted and replaced with the drawing sheets, consisting of Fig. 1-7, as shown on the attached pages.

Signed and Sealed this

Page 1 of 9

Third Day of May, 2005

JON W. DUDAS Director of the United States Patent and Trademark Office

# (12) United States Patent

Weimer et al.

(10) Patent No.:

US 6,848,623 B2

(45) Date of Patent:

Feb. 1, 2005

#### (54) METHOD AND APPARATUS FOR CENTRALLY CONTROLLING **ENVIRONMENTAL CHARACTERISTICS OF MULTIPLE AIR SYSTEMS**

(75) Inventors: John R. Welmer, Stacy, MN (US); Timothy G. Hoyez, Circle Pines, MN

(US)

(73) Assignce: Tjernlund Products, Inc., White Bear

Lake, MN (US)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 10/671,331

(22) Filed: Sep. 25, 2003

(65)**Prior Publication Data** 

US 2004/0104276 A1 Jun. 3, 2004

## Related U.S. Application Data

(62)	Division of application No. 09/922,934, filed on Aug.	6,
	2001, now Pai. No. 6,726,111.	
(60)	Provisional application No. 60/223 026, filed on Aug.	4

2000.

(51)	Int. Cl. 7	F24F 7/00
(52)	U.S. Cl 23	36/11; 236/49.3; 126/312
(58)	Field of Search	236/49.3, 11, 51,
		236/1 EA, 1 G; 126/312

#### (56)References Cited

#### U.S. PATENT DOCUMENTS

				Brody et al 62/180
4,189,296	Α	•	2/1980	Hayes 431/20
4,245,779	Λ	•	1/1981	Ardiente 236/1 G
4,299,554	A	~	11/1981	Williams 431/16
4,337,893	Α	•	7/1982	Flanders et al 237/7
4,822,385	Α		4/1989	Strege et al.
4,903,685	$\mathbf{A}$		2/1990	Melink
5,139,009	А		8/1992	Walsh

9/1992	Hibino et al.
9/1993	Ebisu et al.
• 9/1993	Adams et al 236/11
• 5/1994	Adams et al 236/11
5/1995	Azima
5/1995	Hollenbeck
4/1996	Sato et al.
9/1996	Hollenbeck et al.
12/1996	Ahmed et al.
• 4/1997	Hollenbeck
7/1997	Guay et al.
11/1997	
8/1998	Tulpule
8/1998	Hibberd et al.
9/1998	Rowlette et al.
* 10/1999	Hammer 236/11
11/1999	
1/2000	Nakanishi et al.
	9/1993 • 9/1993 • 5/1994 5/1995 5/1995 4/1996 9/1996 • 4/1997 7/1997 11/1997 8/1998 8/1998 9/1998 • 10/1999 11/1999

### (List continued on next page.)

### OTHER PUBLICATIONS

Mechanical Venting of Chimney and Stacks, brochure, Exhausto, 8 pgs., Sep. 1997.

Hoyez et al.; Thermostatically Controlled Power Draft Motor Cooling System; U.S. patent application No. 09/774, 277; filing date: Jan. 30, 2001.

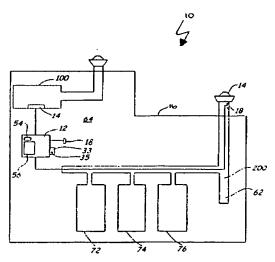
#### Primary Examiner—Marc Norman

(74) Attorney, Agent, or Firm-Patterson, Thuente, Skaar & Christensen, P.A.

#### (57) **ABSTRACT**

The present invention provides a system and single controller for receiving constant and individualized information from a plurality of air control systems. A single controller is capable of controlling and interacting with at least two separate air control systems to control an environmental characteristic, and in the process, reduces the costs associated with the manufacturing and every day operation of the individual systems. In addition, the controller is capable of intelligently communicating with the input and output devices of the system, and particularly with each individually interfaced appliance, such that the controller can adaptively control the system through the use of stored historical data.

24 Claims, 6 Drawing Sheets



Feb. 1, 2005

Sheet 1 of 7

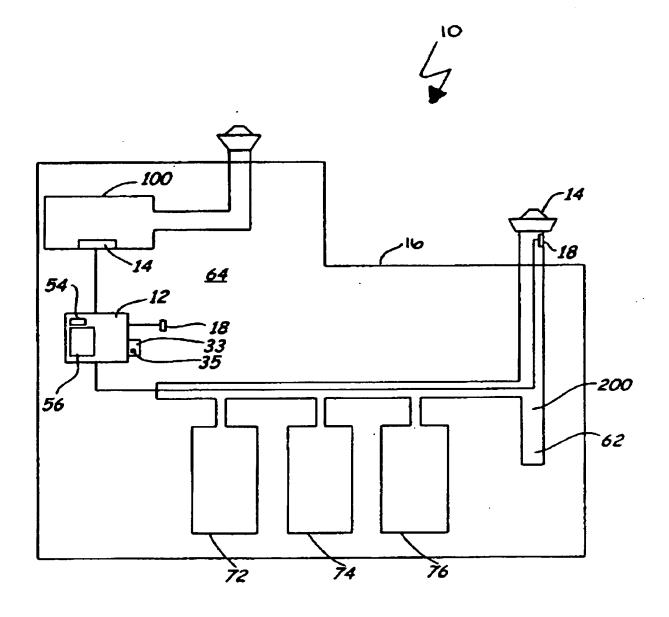
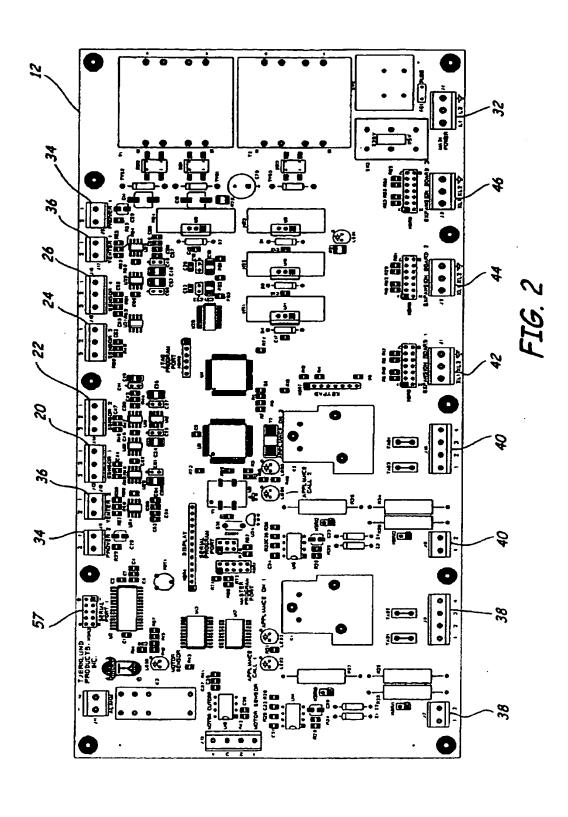


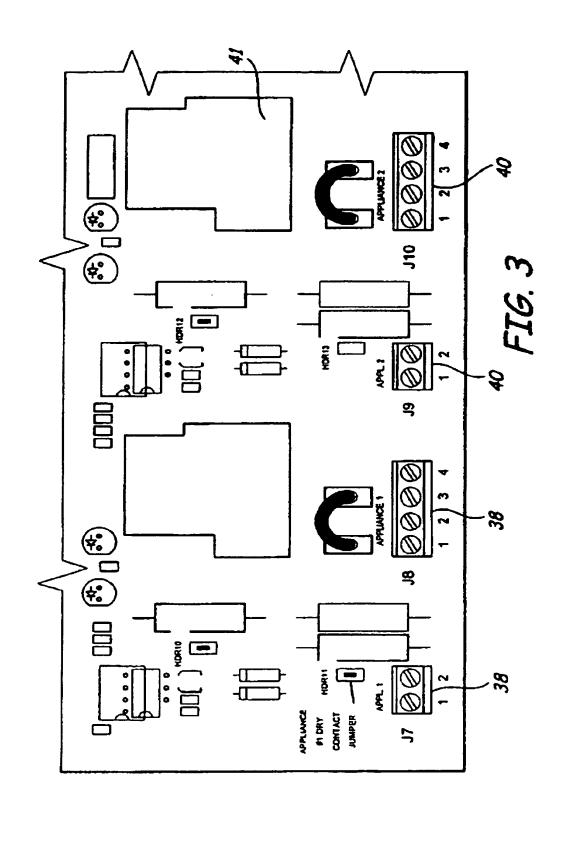
FIG. 1

Feb. 1, 2005 Sheet 2 of 7 6,848,623 B2

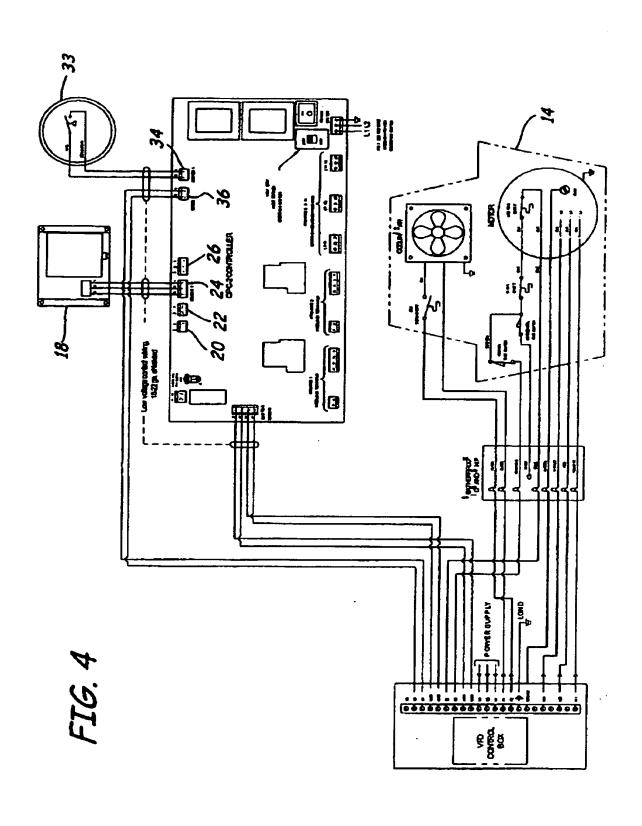


Feb. 1, 2005

Sheet 3 of 7



Feb. 1, 2005 Sheet 4 of 7

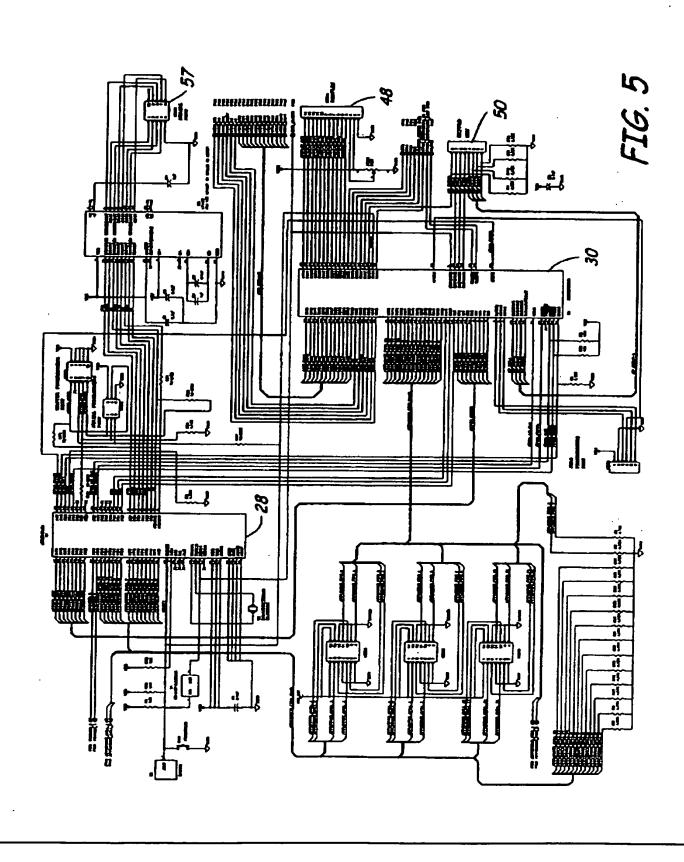


Page 7 of 9

U.S. Patent

Feb. 1, 2005

Sheet 5 of 7

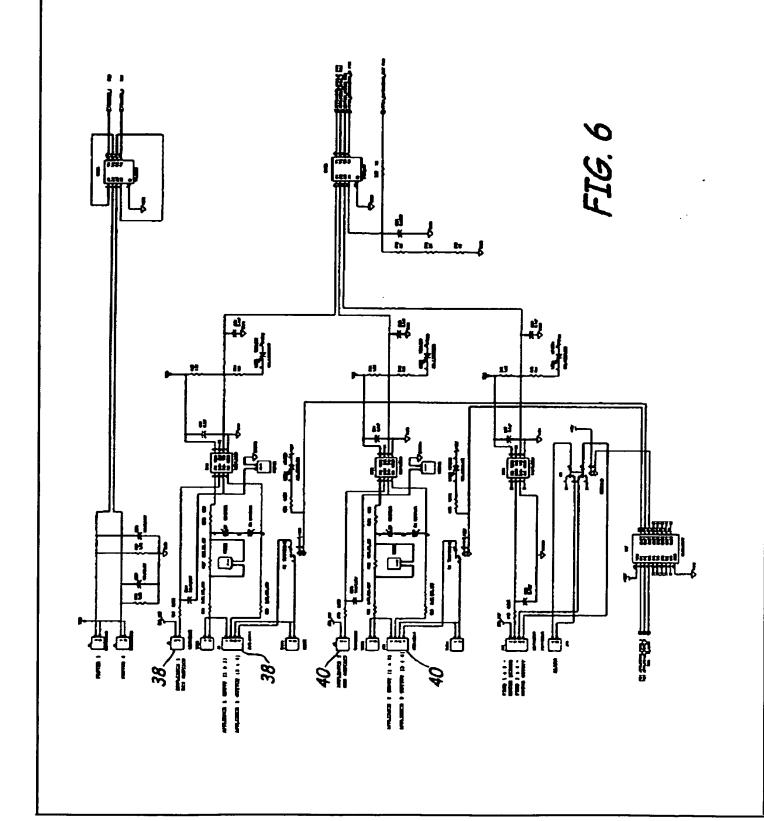


Page 8 of 9

U.S. Patent

Feb. 1, 2005

Sheet 6 of 7



Page 9 of 9

U.S. Patent

Feb. 1, 2005

Sheet 7 of 7

